Battery Wimberly

A Preliminary Topographical and Documentary Survey

Wormsloe State Historic Site

Savannah, Georgia

by

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August 1992

ABSTRACT

The Site of Battery Wimberly, Wormsloe State Historic Site, Chatham County, Georgia, represents a number of different occupations which have remained relatively intact over the last 125 years. This document reports on a topographical survey to document the fortifications and an historical study to assemble what could be related to their history.

The initial occupation is represented by a shell midden from the Savannah and Irene periods. These two cultural periods mark the Mississippian occupation on the Georgia coast. At Battery Wimberly, these two occupations are underneath the Civil War period fortifications. In some places, the shell midden clearly marks the approximate ground surface prior to earthwork construction because of the shell lensing.

The Confederate earthworks are an excellent example of Civil War earthenwork construction consisting of parapets, traverses and terrepleins. They appear to have been built in two stages. The first period of construction was in 1862 and possibly continued during 1863. The second was underway from about the middle of 1864 and terminated on 20 December 1864 when Savannah was evacuated to save the garrison from capture. A brief occupation and/or inspection by Federal forces followed.

Since that time, the site has been abandoned. It represents, along with the nearby Rose Dhu earthworks, Fort Screven on Green Island and portions of the Fort Bartow works on Causton's Bluff, the finest extant remaining examples of Confederate earthen fortifications.

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ACKNOWLEDGEMENTS

This work is the product of a number of people. The prime mover was site superintendent Joe Thompson with whom I have worked on numerous interpretive projects over the years. He initiated the idea of a topographical survey. Joe was a never ending source of information about the fort. As site superintendent over the last ten years, he has acquired a great deal of data about the site and its history which he readily offered. Any ideas we had were tried out on him first because they had to pass his inspection. He shot down a lot of trial balloons but provided confirmation of many others.

The survey crew consisted of Paul Beddow, Gary Bolos, John Cubbedge, Merv Rice, John Simonton, Brad Spinks and Tammy Wohlbrandt, Armstrong State College students putting their introductory archaeology lessons to practical use with an intense topographic survey. In doing this, they also discovered fortification terminology, sand gnats, ticks and the occasional snake.

A voluntary crew member was Merv Rice Sr., who spent practically every early day of the survey volunteering his free time to help the crew. He brought to the project a long experience in surveying techniques and was a helping hand when the transit would not level or the measurements were off. His enthusiasm for the project was infectious.

A captive member of the crew should also be mentioned. John Babits spent most afternoons after school with the survey crew cutting brush, holding stadia rods, finding and marking datum hubs and generally helping out. He eased the work of everyone because he was always willing to help out. His contributions were no less important because he was six years old.

A number of students who did not actually work on Battery Wimberly contributed a great deal to the project. These include Rick Leech and Claudia Lamas who have both done extensive research on Skidaway Island and the Confederate River Defenses. Gillian Brown, Roger Durham, John Kennington, John Simonton and J. C. Reed have completed papers researching the Civil War defenses of Savannah which proved helpful in this project. Their work demonstrated in a very concrete way the commulative nature of student research when conducted as part of a long-term, planned investigation. The student papers provided a thorough grounding in the Civil War fortifications around Chatham and Bryan Counties.

Maps were generated by computer utilizing the expertise of Ted Schmidt, a student at Armstrong State College who worked out a program to fit our needs. The final rendering of the computer data and generation of graphics was the work of James Terrell a dual major in History and Computer Science. The data were entered by Kevin Quarles, another Armstrong student who used the work as a learning experience in computer data entry.

Mr. Tim Lester provided additional surveying equipment when it became necessary to double crew size. Later, he provided a much longer rod which greatly aided our efforts to map on transects which went across traverses, mounds and gun pit depressions.

The staff at the Georgia Historical Society answered a lot of questions relating to this project, especially in the early days of student papers on the Savannah defenses. Now, most of those answers are finally fitting into place.

I offer you my thanks for your assistance. The way I used the information and your assistance might not be what you intended but they did help. Any errors are my own.

INTRODUCTION

The Site of Battery Wimberly, Wormsloe State Historic Site, Chatham County, Georgia, represents a number of different occupations which have remained relatively intact over the last 125 years. About four years ago, Armstrong State College was requested to submit a proposal for conducting a topographic survey and research study about the Civil War earthworks at Battery Wimberly.

This project resurfaced in late 1989 and was again submitted with work to commence in the late winter. The actual field work began on 21 March and continued until mid-June, as class schedules permitted.

Prior to submission of the initial proposal a walkover survey was conducted which identified the main features of the fort as well as noting that the earthworks lay on top of a prehistoric occupation.

Documentary research continued throughout the project period and consisted of work in the Georgia Historical Society, the Savannah Public Library and the Armstrong State College Archaeology Laboratory where a growing body of data relating to Civil War fortifications has been stored.

SITE HISTORY

Prehistory

The initial occupation of the battery Wimberly area is represented by a shell midden from the Savannah and Irene periods. These two cultural periods mark the Mississippian occupation on the Georgia coast. The Mississippian is a social and political elaboration of the Woodland period which occurred between 1100 BC to AD 1500

In a general sense, the Woodland period reflects the introduction and gradual exploitation of horticulture. The Woodland In effect, the Woodland evolved into the Mississippian, a more complex form of the Woodland marked by much larger villages and social groupings.

Our generalized picture of these people is that they were still exploiters of the estuarine resources, hunting mammals and birds as well as using plants for a variety of purposes. It is difficult to determine if horticulture played an important role in their seasonal round or not (Krause 1985:26), but very intensive exploitation of floral resources such as nuts and seeds enhanced their lifestyle and made permanent living sites possible (Hudson 1978:56-7).

Figure 1
Site Location on USGS Quadrangle Map
(Isle of Hope 1988)

The Woodland Stage on the Georgia coast evolved through several periods marked by different ceramic types. These are Refuge (1100 BC-400 BC), Deptford (400 BC-AD 500), and Wilmington (AD 500-1000) (Thomas et al. 1979:109-132). The changing ceramic types appear to coincide with slowly evolving social complexity.

Growing social complexity is an interpretation based on earthen mounds which have been found along the coast. The erection of the mounds, ostensibly for burial purposes, has been thought to represent labor of numerous people organized under a central authority (Thomas et al.:1979:148-150). This level of organization has been seen as a chiefdom (Renfrew 1985:243-4). Even if a chiefdom were not fully established, the presence of the mounds suggests more permanent settlement and more complex social organization than found in earlier time periods. It was not as complex as the later Mississippian period (Thomas et al. 1979:150).

One of the best ways for identifying these people and their time period is to examine pottery found on sites they occupied. In the ceramics, fiber tempered, slab-sided vessels yield to vessels made by coiling sand, or sand and grit, tempered paste. Both the coiling and the change in temper represent technological evolution which permitted increased vessel size with thinner walls. Decorative techniques continue to reflect those of early time periods with punctate, incised and stamped motifs.

By 1000 AD, through several possible alternative scenarios, the Mississippian Stage reached the southeastern coast. This stage developed much earlier (circa 700 AD) along the Mississippi River (Hudson 1978:77). The Mississippian is seen as an intensive horticultural stage, marked by more complex levels of social integration. In effect, it is simply a continued development of the Woodland Stage, marked by more extensive and intensive exploitation of cultigens. Chief among these cultigens is a new species of corn, "eastern flint", which was seemingly well adapted to the southeastern environment (Hudson 1978:80).

One scenario has an immigrant farming group displacing existing Woodland groups. A second possibility is that between 700 and 900 AD Woodland groups evolved, via diffusion and acceptance of ideas and practices, into Mississippian Indians. The third explanation is that cultivators introduced plants and practices which created settled living and resulted in local Mississippian lifestyles (Krause 1985:28-29).

By whatever means, around 1000 AD a population boom occurred which has been attributed to the introduction of maize agriculture. On the Georgia coast this archaeological culture is divided into segments with terminology derived from ceramic types called Savannah (AD 900-1300), Irene (AD 1300-1550) and Altamaha (or Sutherland Bluff) (AD 1550-1700).

Savannah I (AD 1150-1200) ceramics are grit and/or sand tempered, although some occasional sherd tempering does occur (Williams 1977:125,127). During Savannah I, only fine cord marked, plain and burnished plain are found. Savannah II (AD 1200-1250) ceramics are identical to Savannah I with the addition of check stamping. Savannah III (AD 1250-1300) ceramics are, like Savannah II, virtually identical with Savannah I. The division is made on the basis on a new surface treatment, complicated stamping, which is introduced about 1250 AD (Thomas et al 1979:111-12). While surface treatment of Savannah III wares includes plain, fine cord marked and check stamped fragments, most sherds seen at Battery Wimberly are plain.

Irene I (AD 1300-1400) ceramics are very fine grit tempered, often with a dark surface and paste. The surface treatment includes complicated stamping and burnishing/polishing as well as undecorated types. Irene II (AD 1400-1550) ceramics are somewhat finer and thinner than those of the preceding Savannah periods. The most recognizable form is a thin walled, dark paste, elaborately incised ware. Irene Incised ceramics are a minor but very distinguishable presence on late pre-contact and contact sites. The incised Irene ceramics are, in fact, the major distinguishing element for Irene II. The surface treatment also includes plain and complicated stamping (filfot) decorations. Irene ceramics are not common on the bluff.

The latest stages, Irene II and Altamaha, are occasionally found in conjunction with European materials (Braley 1986:13-14) but discussion continues as to their contemporaneity. They may, therefore, reflect cultural contact between the old world and the new, following Spanish, French and later English exploration and expansion along the Georgia coast. Neither Irene II nor later aboriginal ceramics (Altamaha/Southerland Bluff) were found on Battery Wimberly's bluff line or intertidal "beach."

At Battery Wimberly, the two prehistoric occupations lie underneath Civil War fortifications. No collecting was attempted during the survey but Savannah and Irene ceramics were noted. The remnants of what appeared to be a daub wall were also noted on the river face where wave action has eroded portions of the bank.

In some places, the shell midden serves as a marker of approximate ground surface when earthwork construction started because the shell lens separates the earthwork from 1860 ground surface. Some of the shell deposit was dug up in the creation of the earthworks. Encountered in a discrete lens, it marks the original ground surface when the fort was built.

Historic Period

After European contact, the area presently occupied by Battery Wimberly probably did not see much use, except as fields. The main concentration of efforts by Noble Jones was located to the north of the site. Jones built a fortified house which was abandoned when a more modern plantation dwelling was erected. At the time of the Civil War, maps suggest the site was used for planting crops.

The Civil War Earthworks

Permanent fortifications are distinguished by the use of durable materials and more formidible obstacles as well as a sense that an attack would take longer and be more costly (Mahan 1968:1, 211). Temporary, or field fortifications were those to be occupied for a short time or a campaign and would be constructed of "perishable materials, as earth and wood" (Mahan 1968:2). Battery Wimberly, as is the case for most of the Civil War-era Savannah earthwork defenses, does not fit readily in either description since the position was heavily fortified and existed far longer than a single campaign, but was built of earth.

Construction of the fort followed standardized rules which governed the siting, heighth and width of walls as well as ditch depth and width (Mahan 1968). The actual construction of the fortification also followed the manual and can be seen as fairly practical.

> "Poles having been planted at the angles of the work, and the height of the interior crest marked on them, a line is traced on the ground, with a pick, showing the direction of the interior crests. At suitable distances, say from twenty to thirty yards apart, cords are stretched between two stout pickets, in a direction perpendicular to the line marked out by the pick; these cords should be exactly horizontal. A stout square picket is driven firmly into the gorund, where the cord crosses above the pickline, and a slip of pine, on which the height of the interior crest is marked, is nailed to the picket. The thickness of the parapet is measured on the cord, and a picket driven into the ground to mark the point. The base of the interior slope, and the tread of the banquette, are set off in a similar manner; and a slip of deal is nailed to each of the pickets. The height of the exterior crest, and the tread of the banquette, are easily ascertained, from the position of the cord, and the interior crest; these points having been marked on their respective slips

> the outline of the parapet is shown by connecting them by other slips, which are nailed to the uprights; the banquette slope, and the exterior slope, will be determined by a similar process.
>
> "From the profiles thus formed perpendicular to the interior crests, the oblique profiles at the angles can readily be set up, by a process which will suggest itself without explanation.
>
> "Having completed the profile, the foot of the banquet, and that of the exterior slope, are marked out with the pick, and also the crests of the scarp and counterscarp. All the arrangements preparatory to commencing the excavation are now complete." (Mahan 1968:47-49).

The foregoing paragraphs simply mean that the work will be traced out on the ground, posts erected to the height the walls should reach at various points and lines strung between them. The earth is simply thrown up, pounded into place according to the outline of poles and string, and then finished.

Construction on Battery Wimberly probably conmenced after Skidaway Island was evacuated in March 1862 (Lamas 1989:55-56). The outer islands were all abandoned during early 1862 because the Confederate command felt they could not be defended given the mobility of the Union Navy which could concentrate men and material on more points faster than the Confederacy could respond to defend them (Lee 1862a, 1862b; Mercur 1862:386-87).

It is possible that the works were under construction prior to the evacuation of Skidaway Island but the concerted effort and manpower required on the outer islands makes this seem unlikely. As soon as Skidaway Island was given up, the Confederates embarked on the creation of a new defense line on the Isle of Hope (Lamas 1989:39). It is likely that Battery Wimberly was part of this effort.

During 1863, it is difficult to tell what was being done on Battery Wimberly. The earth works would have required continual maintainence, even if the tops and slopes were covered with sod which is documented for other Savannah defensive works (Babits et al 1987:V:52).

Some knowledge of the site in 1864 can be obtained in the correspondance dealing with the USS Water Witch, a vessel captured by a Confederate boarding party on 3 Jume 1864 (Water Witch 1974:7). The Confederate Navy wanted to bring the ship around to Savannah but the safer passages were too shallow and the more exposed channels were heavily obstructed. The discussion of

alternatives regarding the vessel shows that it would have taken a crew of 75 men about six days to have cleared the channel (Water Witch 1974:36) which was disputed by an engineer claiming it would take 200 men over six weeks to do the work (Ibid:39). The proposals pointed out that the outer passage was not safe due to the Union presence and that Skidaway Narrows would have to be used (Water Witch 1974:47).

The correspondance reveals that Skidaway Narrows were almost passable for a vessel drawing but eight feet. This means that shallow draft vessels could have continued to use this waterway and the presence of a draw bridge confirms it. Thus, the southernmost gun mounting was necessary to cover this approach.

By the late summer of 1864, the impending threat posed by Sherman's advancing armies as well as the Union Navy apparently encouraged renewed efforts to fortify all the approaches to Savannah. It is highly probable that additional work was carried out on Battery Wimberly during the late fall of 1864. Based on the earthworks at Causton's Bluff, alterations would have included thickening parapet walls and construction of additional traverses and bombproofs.

Today the depression here is over eight feet deep. This is much deeper than any permanent or field gun could fire over without specialized carriages. Between the depression and the traverse is a gun platform area where the parapet would have been a standard four or five feet high. The depression sides extend back from the parapet base an angle of 45 degress.

At the rear of the depression on its north and south ends are ramps which are not wide enough to have allowed artillery limbers to have entered the depression. These circa five feet-wide approaches are much more likely to have served to purposes. First, they allowed wheelbarrows to carry soil out of the depression during its construction. Second, they might well be entrance points of a proposed bombproof which would have been built in the depression and then covered over with soil.

The excavation ramps make good sense. The proposed entrance ways for a bombproof or magazine are more subjective. The soil which was removed was not simply piled for reuse but mounded into traverses or parapets which implies that these new works were a finished product. The parapet is certainly thick enough at this point and the line of fire to the top of the parapet would have gone over any framing of an underground structure at this point. The proximity of a gun platform would also require a magazine. Without excavation and demonstration that there are postmolds from an internal structure in the depression, any interpretation of its use would be premature.

METHODOLOGY

Since the project was to map the Civil War emplacements, the field methodology was geared toward surveying techniques. The initial step was to lay out a baseline incorporating as much of the Moon River parapet as possible. At the south end of the parapet a permanent datum hub was set into the ground to mark the terminus of the baseline at grid N320E500 (Figure 2D).

Another datum hub was emplaced on top of the first traverse to the north. This hub was located at an arbitrary grid point numbered N500E500. Since the parapet curved to the east a short distance beyond this second datum hub, it was necessary to displace the instrument repeatedly to allow coverage of the river parapet.

Additional datum hubs were emplaced at key points on the earthworks. These include one on the rear traverse (#4) at N480E575. Other datum hubs were located at N605E650, N410E552, N605E740. Another datum hub was located on the third, or most northern, traverse at grid N. These points should serve as permanent markers to reestablish the grid if additional work is conducted on the site. Every concrete datum hub has a 1989 or 1990 penny under it. This dating procedure was followed to ensure that the archaeological survey hubs would not be confused with other survey hubs which might be emplaced in the area.

At five foot intervals along the parapet, 40d galvanized nails with flagging were set out along the grid line 500E and used as transect points to extend the grid to the east and west. In order to properly establish elevations, these were all shot in during the creation of the initial baseline. Nails were set into three large trees to serve as permanent elevation datums.

The trees were located on three traverses. On Traverse #2, the tree was located at on the eastern end of the traverse. On Traverse #3, the tree was located more to the central portion of the mound. On Traverse #4, due east of the N500E500 main grid datum, the elevation was located ont he north end of the traverse.

These were all located on traverses to provide an arbitrary elevation of 100 feet. All references to elevation are made in terms of BD (Below Datum) because the nails were set high enough that all points on the site were below them. As baselines were shot in, elevations were given to each point so that the instrument heights could be obtained even where line-of-sight to an elevation datum was not possible.

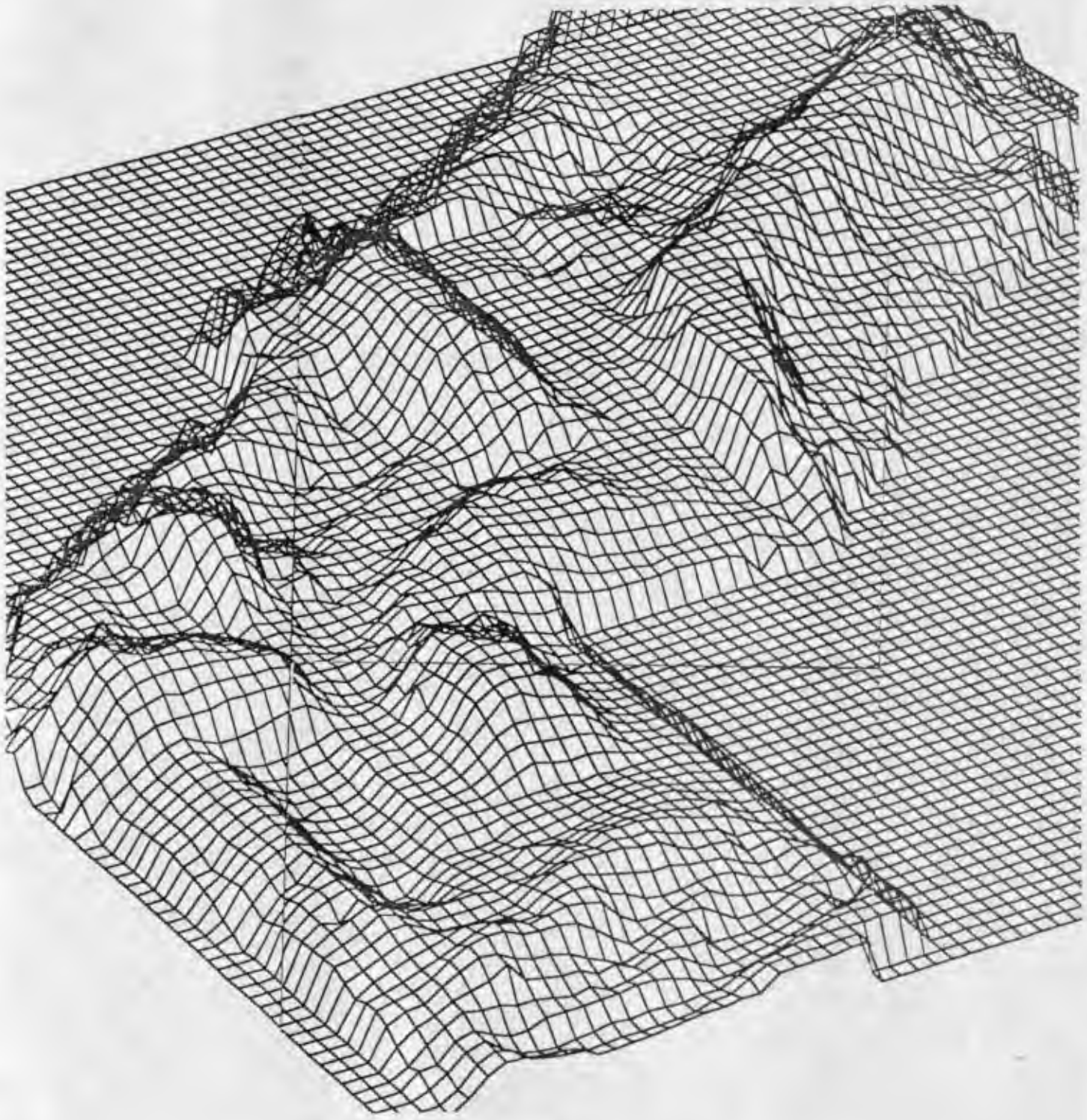

Figure 2B
Isometric Basemap of Battery Wimberly
30 Degrees Elevation/30 Degrees Orientation (View to North)

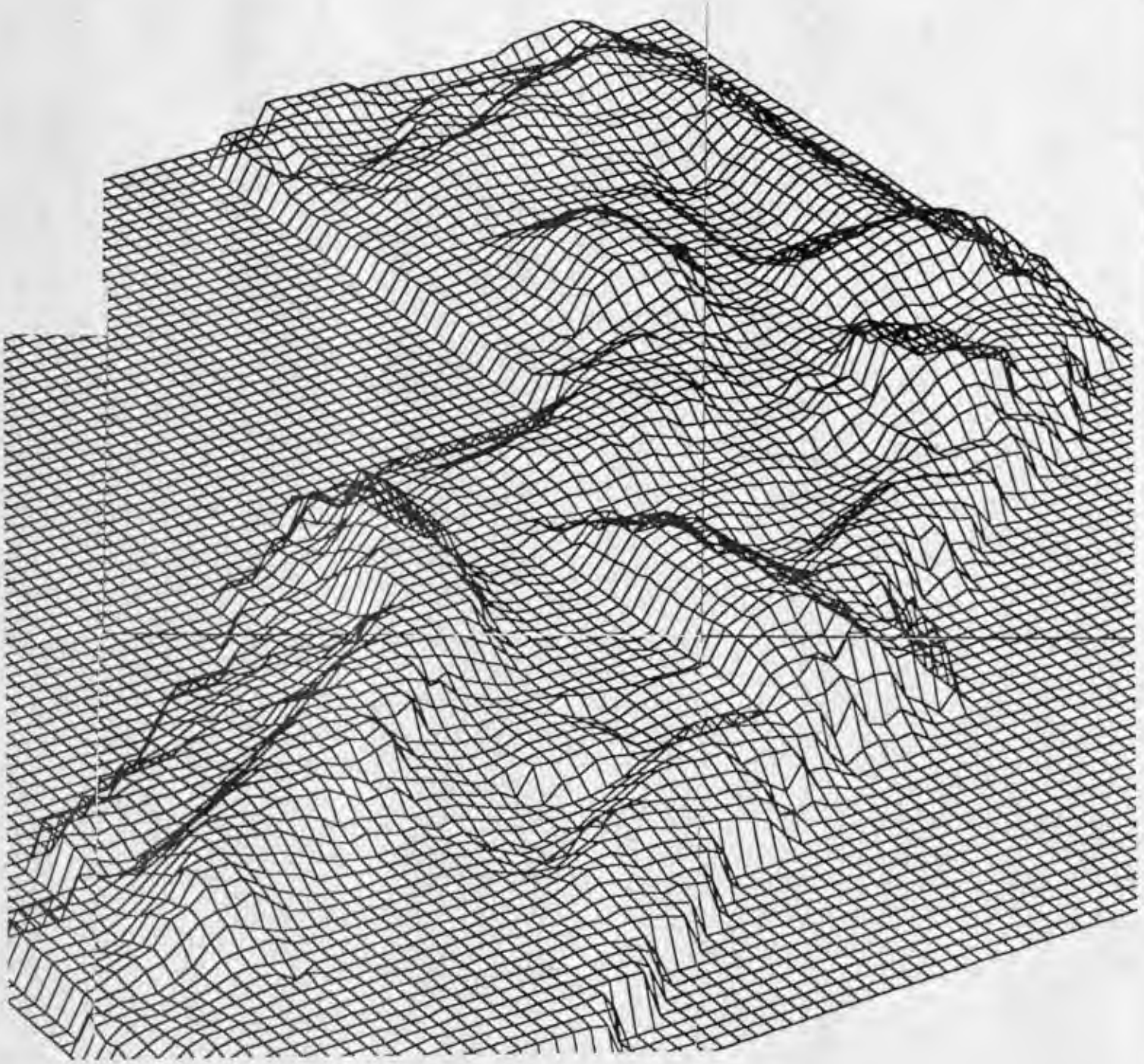

Figure 2A
Isometric Basemap of Battery Wimberly
30 Degrees Elevation/210 Degrees Orientation (View to South)

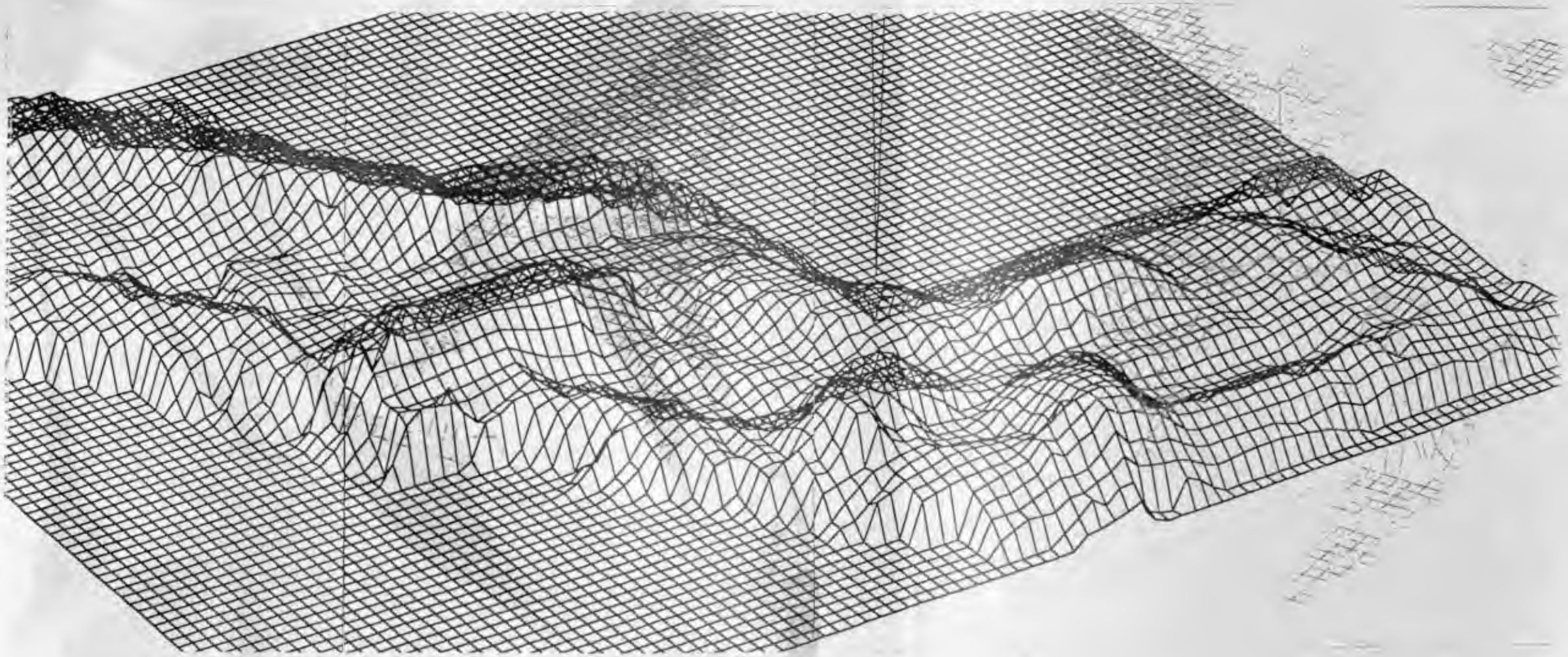

Figure 2C
Isometric Basemap of Battery Wimberly
30 Degrees Elevation/120 Orientation (View to East)

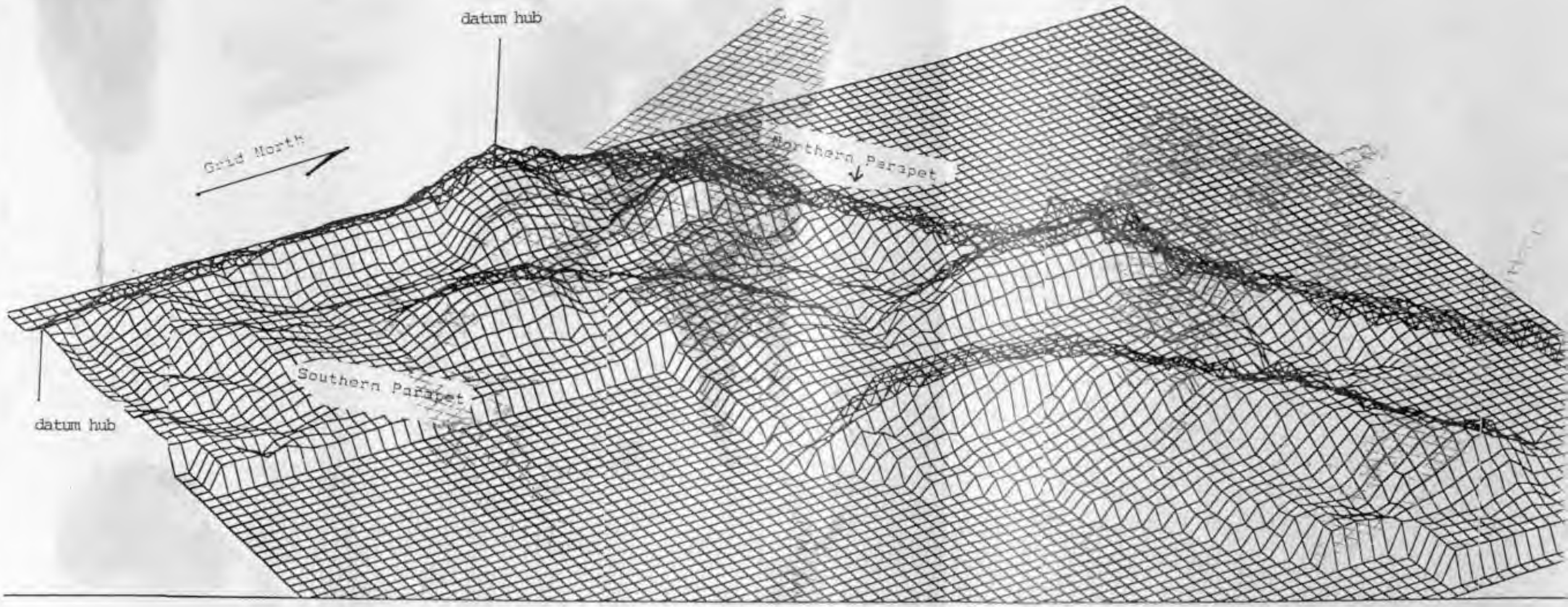

Figure 2D
Isometric Basemap of Battery Wimberly
30 Degrees Elevation/300 Degrees Orientation (View to West)

During the course of the survey work, a US Coast and Geodetic Survey marker was found buried under three inches of soil. This was located on the parapet at the base of Traverse II. It was marked "FORT 1934 #2." This bench mark does not appear on the 1979 Isle of Hope Quadrangle. It was found fortuitously, when a tool was stuck into the ground at this point and struck the brass plate giving out a distinctive ring. This datum hub was 8.82 feet below datum as used by this survey project. The marker was located at N561.5E514.5.

Each transect from the base line was surveyed at five foot intervals to provide the elevation data for creating the contour map. Positional accuracy was provided by transit and stadia rod to control for distance from known points and elevation. In some sections of the fort, transects were run at ten foot intervals because they were recording very regular linear features. When the transects were ten feet apart, the recording interval was still five feet. When curving structures, small features, ramps and the ends of mounds were encountered, transects were run every five feet.

As the work proceeded, it became obvious the fort was not laid out along a straight line nor at right angles. Consequently, a number of additional base lines were laid out. These were located along E610 from N505 to N535; along E650 between N535 and N605; along E585 from N480 to NN550; along E575 from N490 to N520. All base lines were marked with 40d nails at five foot intervals. Each point then served as the datum for elevation controls and as the start point for a transect.

These additional base lines were necessary for one of two reasons. First, the original base line did not follow the northern portions of the river face of the fort so additional transects could not be run from it. The second reason for displacing the base line was due to a combination of factors including curvature of the riverside parapet, traverse elevations and trees in the line of sight to the north and/or rear of the fort. It was simply not possible to record elevations over some of the mounds when the instrument was located on a lower elevation. Consequently, base lines were generally located to cover as much high ground as possible to allow sight lines across the fort.

The contour map was generated using a McIntosh Computer with a Wingz program. Data were entered as soon as the program was finished and field checking of relief and mound configuration was accomplished so that especially difficult features could be more elaborately surveyed for greater accuracy.

This program was not entirely satisfactory. It was initially thought that it would be possible to omit alternate transects across the site. The program would then generate contour intrervals

by smoothing the data. This did not occur and the missing transects were shown as depressions. Consequently a great deal more surveying was required than if the graphics had been created by hand.

Once the data were entered, smoothing was necessary. This proved to be tedious within the parameters of the program because generation of the graphics was very slow. Without the graphics as an aid to smoothing, alteration of elevation points was extremely dangerous. The repeated shifting between graphic illustration of the earthworks and the numerical portrayal was very time consuming.

The program portrayed landscape features very well when they were oriented along the north-sout/east-west axes. However, when the earthworks ran at an angle to the axes, the portrayal was neither uniform, nor informative because peaks and valleys occurred along what should have been reasonably straight linear features.

In visual portrayal of the fortifications, the best, or two best, orientation was utilized. Again, this was not entirely satisfactory. Thirty degrees of elevation showed more of the features in a clear and coherent fashion than lower or higher viewing elevations. The four directions which best illustrated the earthwork mounds were 30, 120, 210 and 300 degrees in reference to grid north. Since grid north was oriented pricely along the southwest parapet, the southern end of the fortification was the most clear in the representation. The northern elements of the fortification had errors due to the linear features crossing the grid at an angle which the program did not precisely translate.

During the field survey, the principle investigator made inspection visits to other earthwork sites for comparative purposes. The site visit to Fort McAllister was of particular use because the fort is cleared of tree cover and the mounds can be placed in perspective. Measurements were made detailing parapet height, gun tube elevation, traverse height and gun pit floor relationships at Fort McAllister and Fort Jackson, a brick and masonry fortification which has a remounted 32 pounder placed <u>en barbette</u>. The observations have been incorporated with the interpretive section of the report.

No artifacts were recovered. All field notes, drawings and sketch maps have placed in storage at the Archaeology Laboratory, Armstrong State College where they may be inspected by interested persons. Copies of this report were provided to the Department of Natural Resources as part of the contract. Other copies have been placed on file at the Georgia Historical Society, the Coastal Georgia Archaeological Society and the Minis Room, Armstrong State College Library.

FINDINGS

Construction of the earthwork required a great deal of soil. This was apparently all generated locally as the landscape behind the fort is about three to five feet lower than areas further back and to the sides of the fort. A similar pattern of excavation was noted at Fort Screven on Green Island (Babits 1989), at Causton's Bluff (Babits et al. 1987), Rose Dhu (Brown 1983) and at Fort McAllister (Durham 1985).

The major features of the fortification are the parapet, the gun emplacements, the traverses, the ditch, and the well. These are dealt with as individual features but they compose a totality called the fort.

The Parapet (Figure 3)

> The Parapet is "a covering mass, or embankment, ... to shelter the assailed from the enemy's missiles, to enable them to use their weapons with effect, and to present an obstacle to the enemy's progress, ..." (Mahan 1968:2). "The general form of the parapet is the same for all works. ... The command of a field work over the ground occupied by the enemy must never be less than five feet; nor less than six feet six inches over that occupied by the assailed. ... .
>
> The thickness of the parapet, ... so that no shot shall penetrate more than two-thirds the entire thickness." (Mahan 1968:28-30).

The parapet is a wall which protects men taking refuge behind it. At Battery Wimberly, the parapet ran along the south, west and north exterior of the fortification's river frontage. The only places where a parapet was not present were the traverses.

Battery Wimberly is most properly called a battery, a term "usually applied to a collection of several guns ..." (Mahan 1968:79). The three gun emplacements were constructed en barbette:

> "... by means of which a piece can fire over a parapet. It consists of a mound of earth, throwun up against the interior slope, the upper surface of the mound is level, or horizontal, and is two feet nine inches below the interior crest for guns of small caliber, and four feet for heavy guns. If the barbette is made along a face its length should be arranged to allow sixteen-and-a-half to eighteen feet, along the interior crest, for each gun; and its depth, or the perpendicular distance from the foot of the interior slope to the rear, should be twenty-four feet, to allow room for the service of the guns." (Mahan 1968:80).

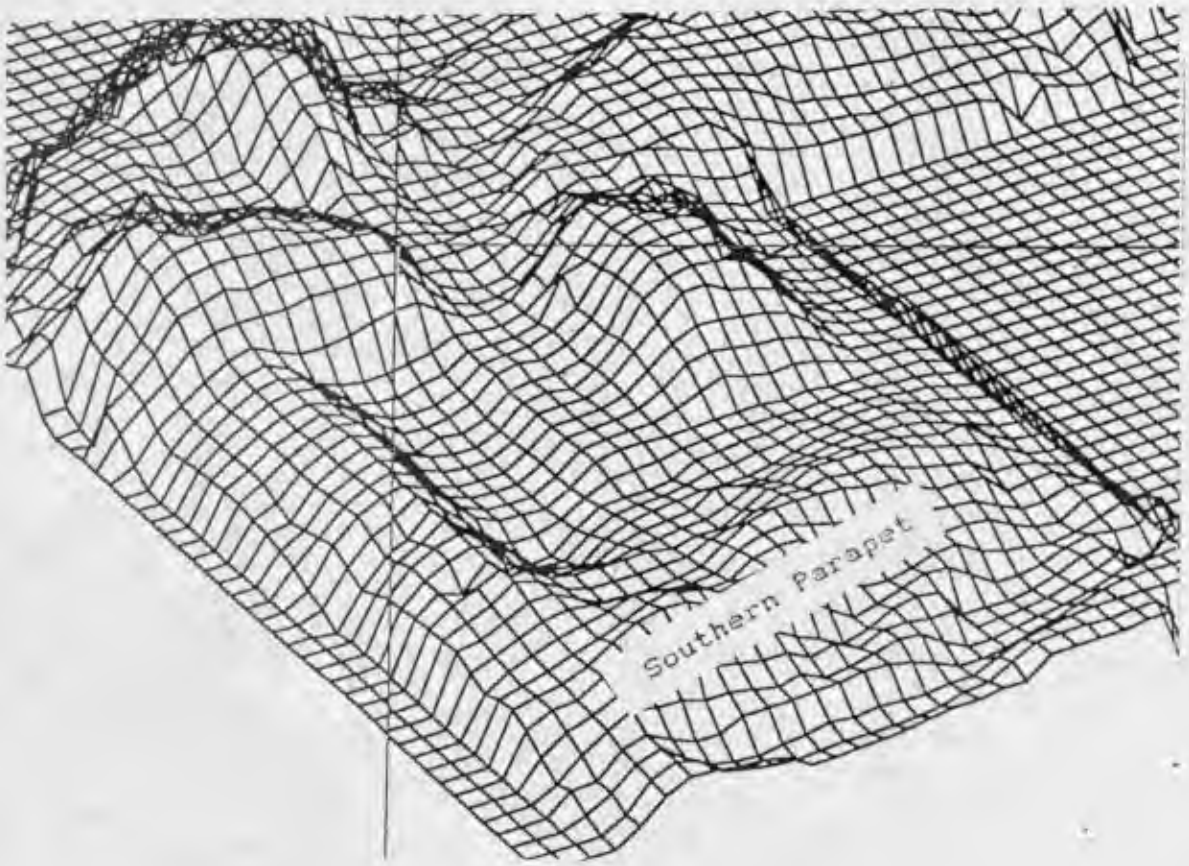

Figure 3
Isometric of Southern Parapet Section
30 Degrees Elevation/30 Degrees Orientation (View to North)

There are three gun emplacements at Battery Wimberly. These are arbitrarily numbered consecutively from south to north. They varied in size, perhaps in response to the gun size and/or its purpose on the fort line. Some, following the plan laid out above, seem to be for light guns, or field pieces. Other emplacements, based on a four foot parapet, were probably planned to mount heavy caliber guns. Generally speaking, a position facing the marsh is for a field piece while those facing across the channel have the higher parapet required for a heavier gun.

The parapet berm facing the marsh seems to have a trench between the scarp and the actual parapet. This depression is not part of normal fortification procedure. There is no covered way leading to it and any soldier entering the trench would be subjected to fire. It is not protected by a traverse from any fire coming from the Back River so a single shot could range through the entire position.

Since the position is not militarily useable, some other function must be sought. It is possible that it was intended that fraise would be mounted here and the trench was dug out to receive them. This is a possibility and there are certainly numerous examples of fraise used late in the war at Petersburg, VA for examply (Davis 1984:VI:225,259,260). It may be that the trench reflects construction methods and that the trench was created by digging into the berm, a platform for throwing the earth up to a higher position, during construction. If this were the case, then the fortification was not completed..

According to Mahan, a shovel full of earth could be "pitched by a man twelve feet in a horizontal direction or six feet in a vertical direction" (1968:49,51-52). The ditch at this point is fairly deep and the top of the counterscarp would have been almost six feet high. The top of the parapet above the counterscarp would have been about six feet higher. Still, it is possible that the position on the counterscarp intended to provide footing for throwing the earth higher was simply dug out to provide more earth once the wall was nearly completed. This latter interpretation has some validit if the fort was still under construction when it was evacuated.

Gun Emplacement Number 1 (Figure 4)

This gun position is on higher ground surrounded by the eroded remnants of the parapet. It is on higher ground above the southern depression which abuts Traverse 1 to the north. The postion seems very open today, a feature undoubtedly related to the type of gun which it was probably designed to mount.

This southern-most gun pit is designed to fire onto the Back (Moon) River as well as across the the marsh toward Skidaway Narrows. Although it is difficult to envision today, the fields were described as cleared in 1870 (Tebeau 1870) and they can be

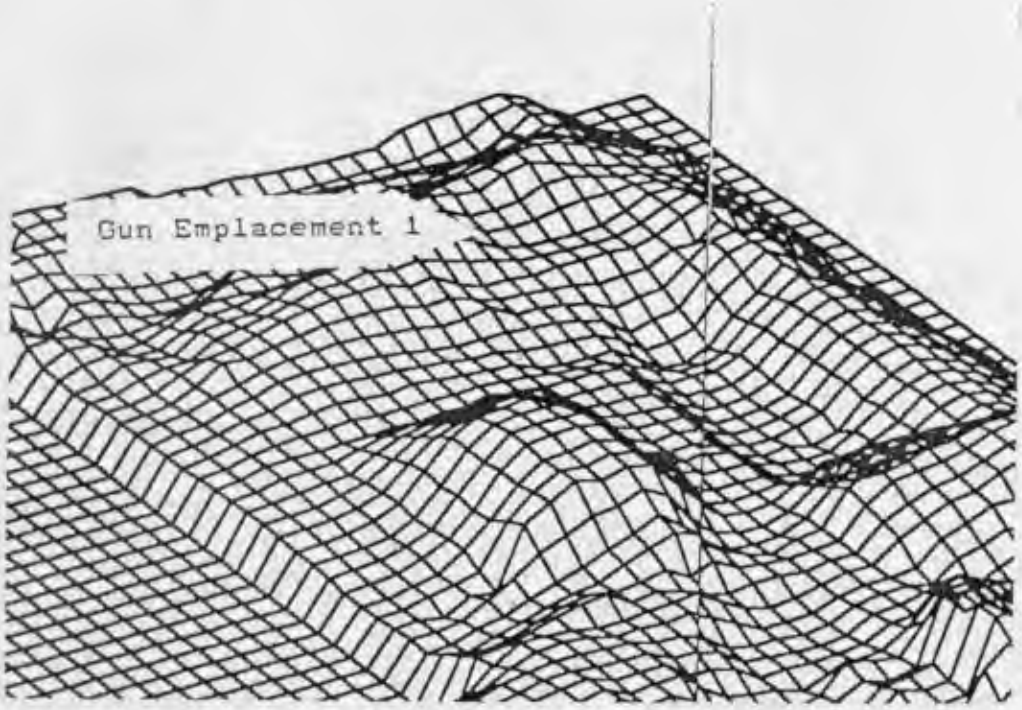

Figure 4
Isometric of Gun Emplacement Number 1
30 Degrees Elevation/210 Degrees Orientation (View to South)

presumed to have been cleared in 1862-1865. Covering fire from this position would help protect the dams used to flood Jones Narrows.

Crossing fire from Battery Wimberly would not have been possible with the unnamed earthwork located on a promotery in what is now Skidaway Island State Park (Simpkins and Lamas 1990:24-27). This other position was almost certainly abandoned prior to construction of Battery Wimberly. At any rate, fire from this south gun at Battery Wimberly would have interdicted any small boat operation attempting to breach the dams or destroy the causeway or ferry between Skidaway Island and Isle of Hope. The gun would have provided limited control over the approaches to both Jones Narrows and Skidaway Narrows from the south.

The lack of any traverse protecting this position from front, side or rear suggests that it may have been mounted with a center pintle gun so that it could traverse over 120 degrees to cover virtually all riverine approaches to the south and east. It is also possible that a siege and garrison type of weapon or a rifled field piece could have been emplaced here. Ideally, a weapon in this position would ideally be rifled but the ranges are fairly short, even to the Skidaway River, and a large smoothbore would have been equally effective against all but ironclads, especially if loaded with grape or cannister.

Gun Emplacement Number 2 (Figure 5)

This gun position was located between Traverse I and Traverse II. It is the second position which appears clearly suited for the use of a permanent carriage. In terms of floor space, height of parapet and traverse location, it agrees very closely with those at Fort McAllister. If it was designed with a permanent carriage in mind, then the most likely configuration was a center pintle carriage of the type employed at Fort McAllister and at Fort Jackson. A carriage of this type has been reconstructed, mounted with a 32 pounder, and is on display at Old Fort Jackson, Savannah, Georgia.

Any weapon at this point would have had an effective, very short range field of fire covering the Back (Moon) River. Since Traverses I and II would limit the range of gun traverse, this position was designed for a very powerful gun designed to stop any vessel which tried to operate in the river.

Gun Emplacement Number 3 (Figure 5)

This gun position is on the northern side of Traverse III. It is likely that, as it currently exists with a parapet height of about four feet, the gun intended for this position was not permanently mounted. Instead, a siege and garrison type of moveable cannon would have been situated here. If that is the case, then it should have taken a 24 pounder siege and garrison or one of the more modern rifled weapons.

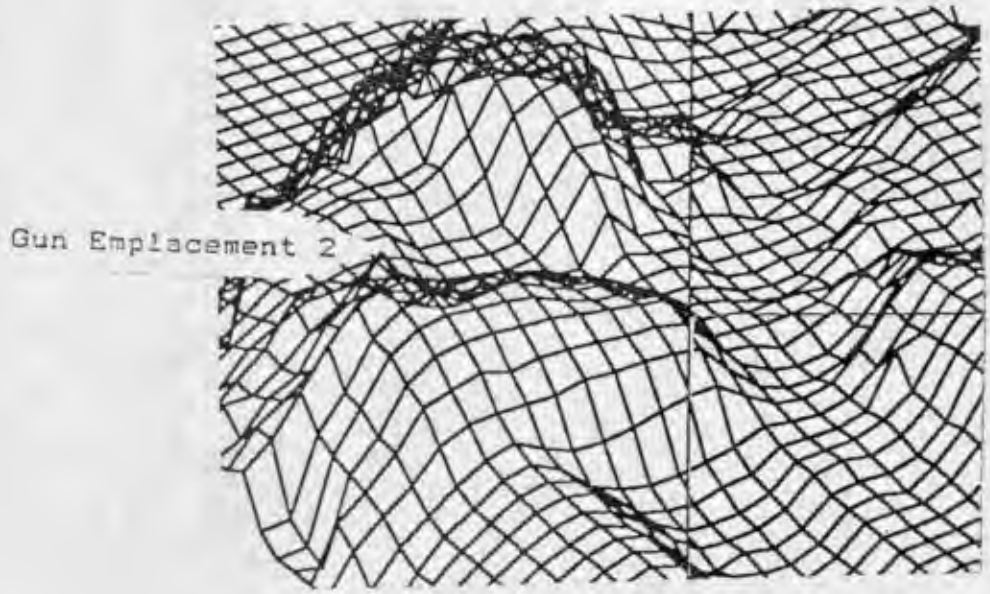

Figure 5A
30 Degrees Elevation/30 Degrees Orientation (View to North)

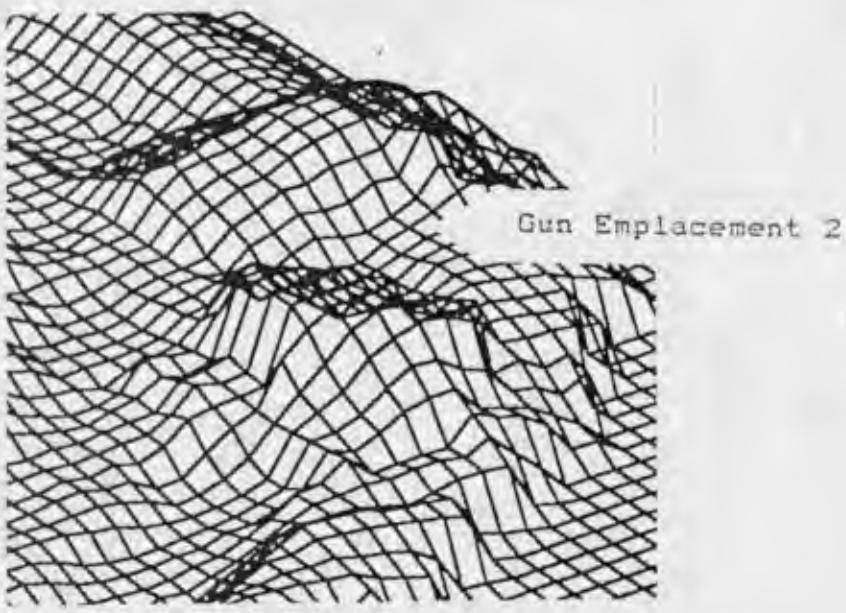

Figure 5B
Isometrics of Gun Emplacement Number 2
30 Degrees Elevation/210 Degrees Orientation (view to South)

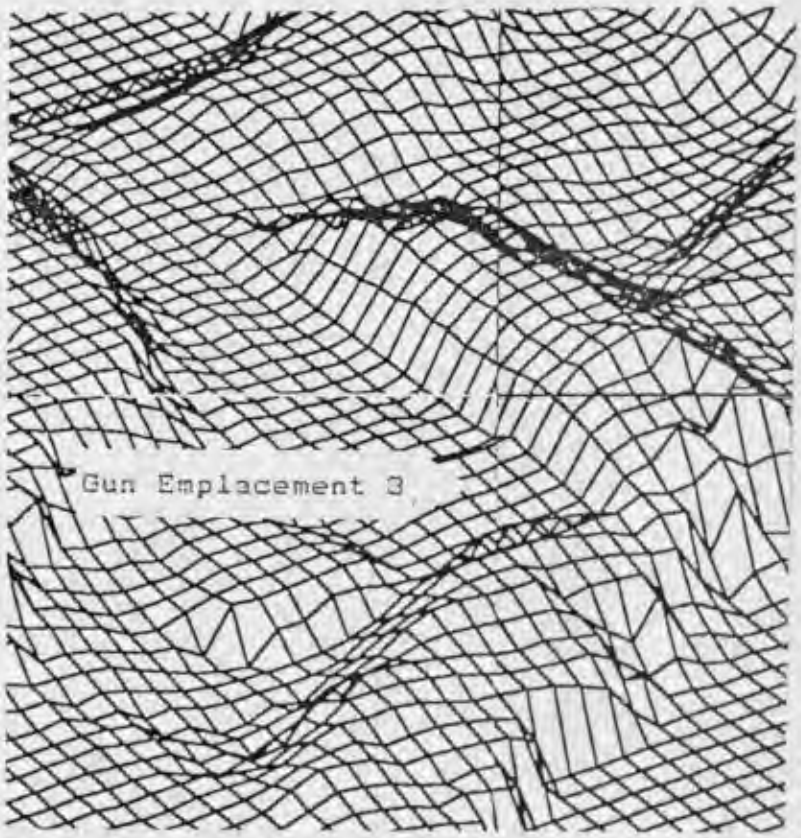

Figure 6
Isometric of Gun Emplacement Number 3
30 Degrees Elevation/210 Degrees Orientation (View to South)

The use of a moveable weapon at this point is not only suggested by the parapet height but also by the ramp which leads to the position. This approach ramp has little elevation change is is directly in line with the sally port at the east end of Traverse III.

The platform seems to be the remnant of a longer terreplein or series of gun positions behind the parapet fronting the river. The northern portions of this position were apparently removed, either to throw up earth to make the parapet higher and wider or to create Traverese VI. It is more likely that the terreplein, if it existed was removed to construct Traverse VI.

The huge depression between the northern parapet, Traverse III and Traverse VI is a source of fill for the mounds. It may have been intended that it would be covered over but the low ground here suggests that if it turned into a bombproof, it would have been constantly damp. Any supporting structures would have been quickly riddled by termites and collapse would have occurred. It is not likely that the depression served as a gunpit, even for mortars. It was too wet and any morter fire would have been likely to shake down the adjacent traverses. It is also not likely that the depression was intended to shelter men and equipment from hostile fire. For one thing, it would have been wet and shell fire bursting overhead would have been lethal without some form of covering. As an immediately available source of material to construct the traverses and parapets, this area was probably taken advantage of to minimize transporting borrowed fill from futher away.

> Traverses are: "mounds of earth thrown up in the work to cover an outlet, to screen the troops from a reverse, or an enfilading fire, &; for powder magazines, when they are not made in the traverses. The area occupied by a traverse will depend on the dimensions of the traverse, and cannot be fixed beforehand; that allowed for a magazine for three or four cannon may be estimated at fifteen or twenty square yards." (Mahan 1968:26)
>
> "The traverse is finished on top like the roof of a house, with a slight pitch; its thinkness at top should seldom exceed ten feet, and will be regulated by the means the enemy can bring to the attack; its sides are made with the natural slope of the earth; but, when the height of the traverse is considerable, the base of the side slopes would occupy a large portion of the interior space; to remedy this, in some measure, the portion of the sides which are below the planes of direct defiladement, may be made steeper than the natural slope; the earth being retained by a revetment of sods, &.
>
> "When the salient of the work is arranged for defense, the traverse cannot be extended to the salient angle; it is usual to change its direction within some

yards of the salient, and unite it with the face most exposed. Traverses are also used to cover faces exposed to an enfilade fire; for this purpose they are placed perpendicular to the face to be covered. If several are required, they may be placed twenty or thirty yards apart; each traverse should be about twenty-four feet long, and thick enough to be cannon proof. ...

"... after the plan of the work has been regulated, the arrangement of the traverses next demand the attention; the only rule that can be laid down is, to place them in the most favorable position to intercept the reverse and enfilading fire of the enemy; and if there should be a choice with respect to several positions, to select the one which will give the lowest traverse." (Mahan 1968:44-45).

There were three traverses associated with the parapet. These are numbered consequtively from south to north. There are also two additional traverses to the rear of the parapet to keep shot from passing beyond the fort where camps might have been located. They would have also protected the gun crews from shell which passed beyond the guns before exploding from causing injuries.

All the traverse measurements are approximate. This is due to two reasons. First, the width varied somewhat down the length of each traverse. Second, in the 125 years since construction halted, the mounds have slumped, eroded and been subjected to tree falls which altered the once precise lines of the mounds. In some cases, the probable presence of a collapsed interior structure alters the elevation, either in the center (Traverse VI) or to the rear (Traverse I).

Traverse I (Figure 7)

This mound was 7.5 feet above the top of the parapet and extends to the rear of the parapet 35 feet. It was circa 20 feet wide at the top. The top of this mound is different from the other two parapet traverses because it slopes to the rear and drops approximately 16 feet in elevation from the front (river) edge.

The slope to the rear is somewhat irregular as it also slopes to the north. It is possible that this slope is the result of slumpage. It is also possible that it might be the result of a collapsed interior chamber. If there was a chamber in the rear portions of this traverse, it probably served as a bombproof magazine for the gun mounted in emplacement 2. Given the limited nature of the slope, especially when compared with depressions associated with bombproof chambers at Causton's Bluff, Whitmarsh Island and Rose Dhu, it is likely that the interior chamber, if it exists inside Traverse I, has not entirely collapsed.

This traverse protected the southern side of gun emplacement 2 from cross fire coming from the south.

Traverse II (Figure 8)

This mound to the north of gun position 2 is in very good condition. It is seven feet above the top of the parapet and extends to the rear approsixmately 30 feet. The traverse has a rectangular top which is 20 x 30 feet. Except for a slight depression in the southwestern corner where a tree has fallen, the top of this traverse is intact.

This traverse protected the northern side of the gun pit from hostile fire. Together with Traverse I, it provide a very secure covered location for the gun emplacment. This traverse does not have any of the indications of an interior chamber.

Traverse III (See figure 9)

This traverse is eight feet above the top of the parapet and extends to the rear 35 feet. It is twelve feet above the interior ground surface of the fort. Since a square rear portion of the mound would effectively block the entrance, the mound comes to a point as it slopes to the original ground surface inside the fort.

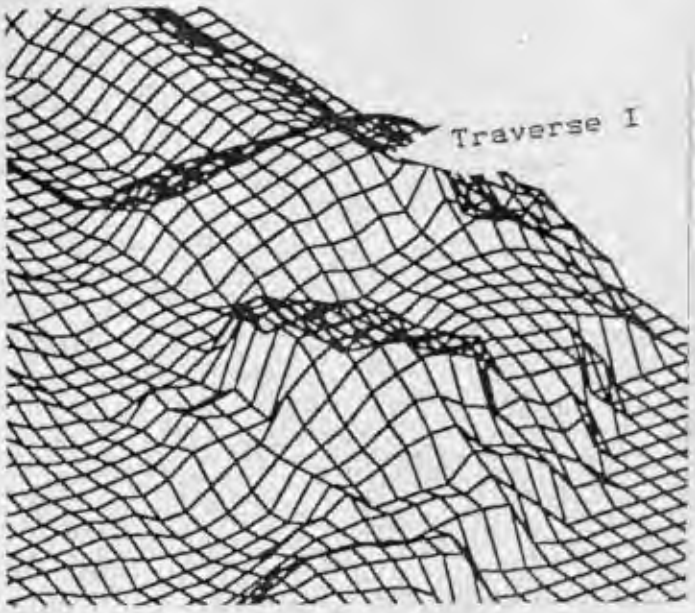

Figure 7A
30 Degrees Elevation/210 Degrees Orientation (View to South)

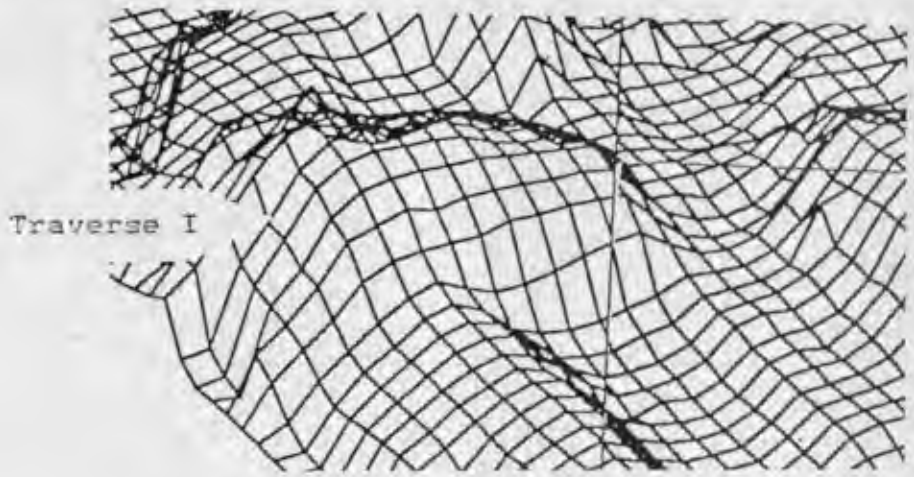

Figure 7B
Isometric of Traverse Number 1
30 Degrees Elevation/30 Degrees Orientation (View to North)

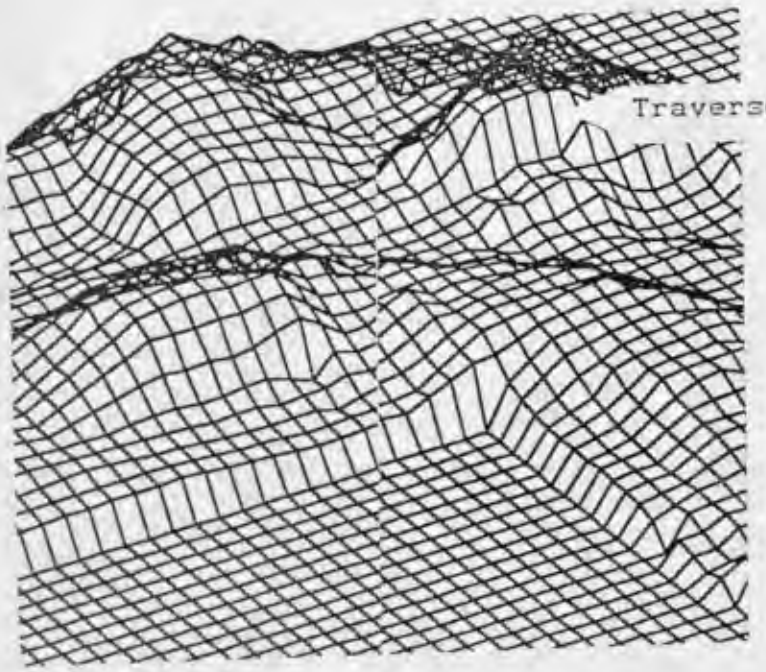

Figure 8A
30 Degrees Elevation/300 Degrees Orientation (View to South)

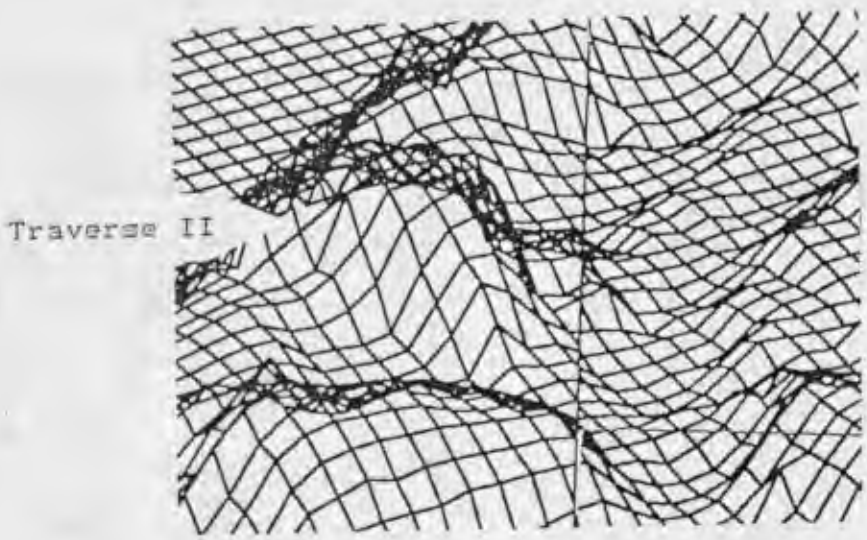

Figure 8B
Isometric of Traverse Number 2
30 Degrees Elevation/30 Degrees Orientation (View to North)

Traverse III has a very regular outline and still possesses reasonably straight walls. This may be due to its steep sides which limited human traffic since the fort was abandoned. There is no central depression indicative of an interior chamber, nor is there any collapsed portion of the side suggestive of a collapsed entrance way.

Three earthen mounds which seal off the rear of the fort from the land side and create covered space behind the river parapet might not properly be called traverses. They are designated by that term in this report for the sake of clarity and continuity.

There has been some speculation that these mounds were bombproofs designed to shelter men under fire or magazines for ammunition storage. These interpretations do not seem likely for Traverse IV and Traverse V since there is no depression visible on the top of either mound. A depression does exist in the top of Traverse VI and seems to indicate a partially collapsed interior chamber. Given its distance from the gun emplacements, it most likely served as a bombproof to protect men from hostile fire.

The interpretation of internal chambers is not idle speculation. Similar depressions provided clear evidence of internal chambers at Fort Bartow on Causton's Bluff (Babits et al 1987:II:30). Similar depressions exist on the mounds at Rose Dhu (Brown 1983) and at Fort Screven on Green Island (Babits 1990:n.p.).

Traverse IV (Figure 11)

This mound is the southernmost of the rear mounds. It is a short, rectangular mound with an elevation eight feet above the original ground surface. Its top is rectangular, measuring circa 15 x 25 feet. The southern end terminates 30 feet from the southeastern parapet curving eastward around gun position 1. It does not join that parapet but stops short, providing an entrance into the southern end of the fort.

Since there is no depression or any indications of a localized collapse on one of the sidewalls, it is unlikely that this traverse served as a bombproof. Its primary function seems to have been to protect the rear of the gun emplacments from fire originating along Skidaway Narrows or to protect equipment from fire coming directly against the gun positions from Back (Moon) River.

Figure 9
1864 Photograph of Traverse
Fort McAllister, Richmond Hill, Georgia

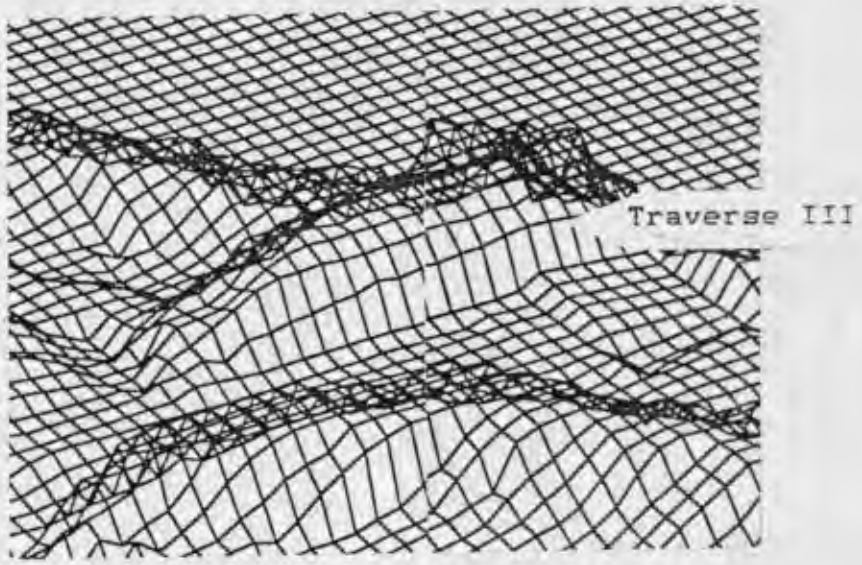

Figure 10A
30 Degrees Elevation/300 Degrees Orientation (View to South)

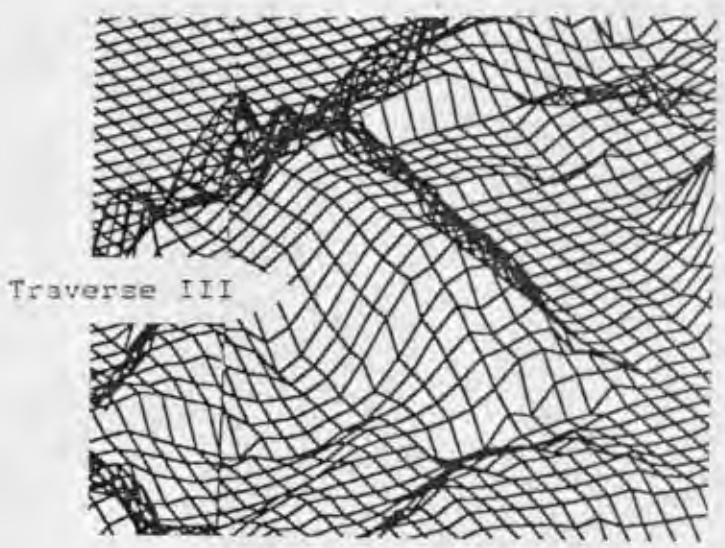

Figure 10B
Isometric of Traverse Number 3
30 Degrees Elevation/30 Degrees Orientation (View to North)

Traverse V (Figure 12)

This traverse is a low, possibly incomplete structure which comnmences with a low point at the north end of Traverse IV. It then runs north, rising as it does so, until it stops circa 20 feet south of the base of Traverse VI. The gap between Traverse V and Traverse VI creates the main entrance into the fort.

The northern twp thirds of the traverse is higher. This section also has a slight out and downward slope suggesting the creation of a reentrant angle along the eastern face. The upper surface also slopes to the east indicating that this may not be a completed structure and that construction of a higher mound was underway when the position was evacuated. This interpretation is reinforced by what appears to be ramps for wheelbarrows along the northeastern perimeter of the traverse.

The entire traverse slopes down to the east in a regular fashion. This is particularly noticeable in the initial low space immediately north of Traverse IV. The area almost appears as if it were a gun position to cover the rear of the battery except that there is no level ground inside the traverse for the gun to be sited.

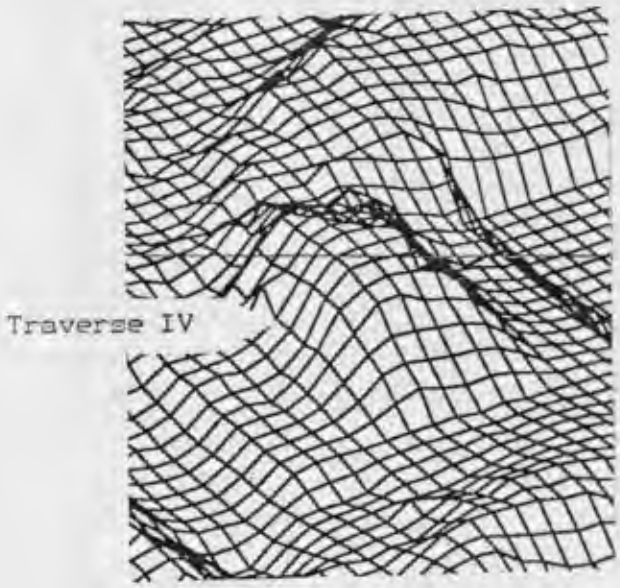

Figure 11A
30 Degrees Elevation/30 Degrees Orientation (View to North)

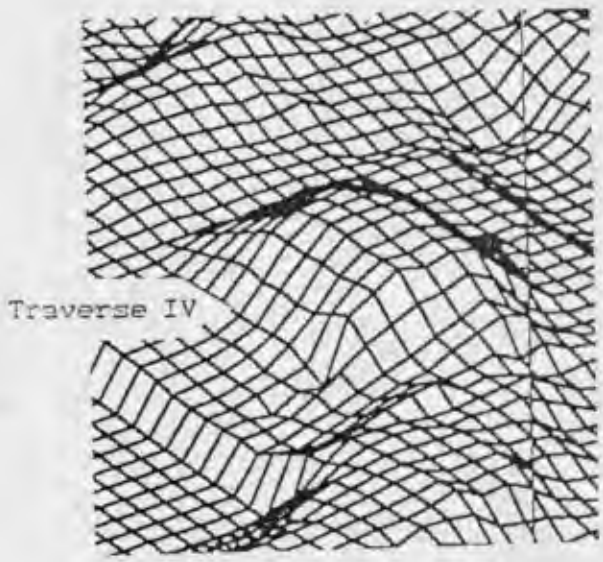

Figure 11B
Isometric of Traverse Number 4
30 Degrees Elevation/210 Degrees Orientation (View to South)

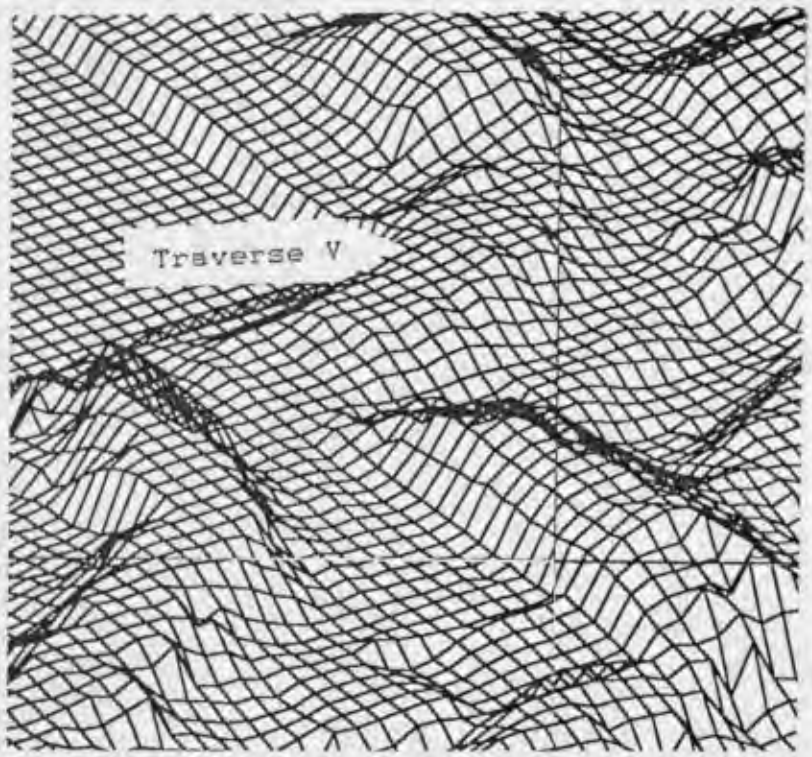

Figure 12
Isometric of Traverse Number 5
30 Degrees Elevation/210 Degrees Orientation (View to South)

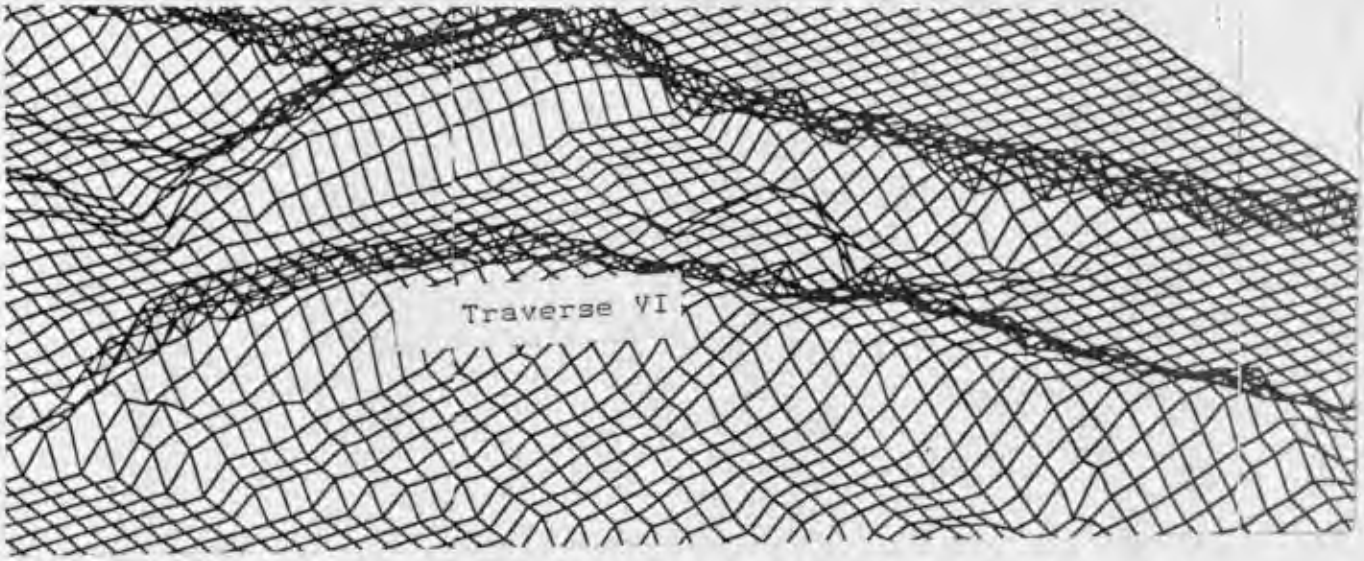

Figure 13A
30 Degrees Elevation/300 Degrees Orientation (View to South)

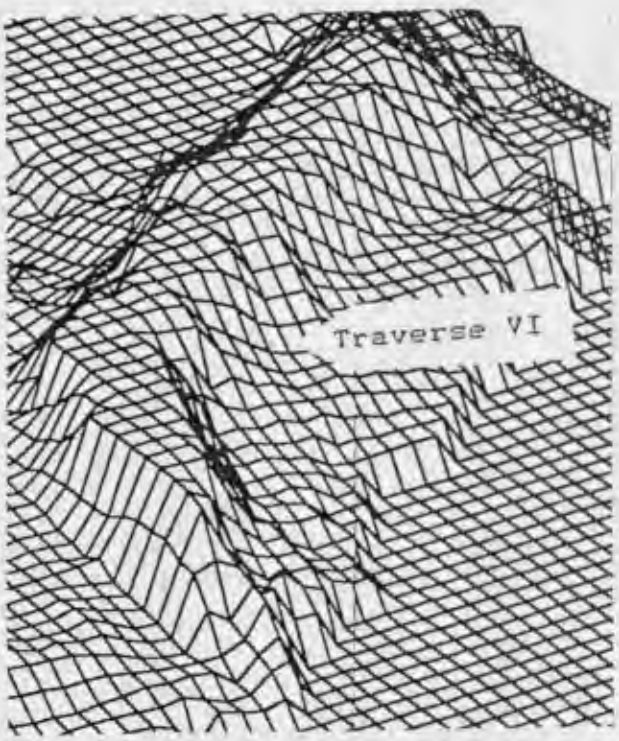

Figure 13B
Isometric of Traverse Number 6
30 Degrees Elevation/30 Degrees Orientation (View to North)

Traverse VI (Figure 13)

This is the most complex of the traverses. It is a very large mound, extending 10 feet above the original ground surface. It is not straight but rather curves from a northly heading to a northeastern heading with an angle of about 120 degrees. The top of this mound is flat and rectangular. It is in remarkably good condition.

At both ends, the mound is not square but comes to a point as the mound gradually lowers and the eastern face cuts back to point. The top is generally 15 feet wide. The top of the northern end of this traverse has a pronounced, though shallow, depression which appears at the northern end but runs for some distance along the top of the mound. Based on the bombproof and magazines at Causton's Bluff, Rooster Point (Rose Dhu Island) and Fort Screven (Green Island), it is thought that this depression indicates an interior chamber. However, there is no obvious depression indicating an entrance at any point along the mound. If the mound has an interior chamber, it has not entirely collapsed. The most likely point for the entrance would by in the angle where the mound turns to the southeast.

The Well

This feature was a circular depression located southeast of Traverse IV at N350E612. It was three feet deep and was twelve feet in diameter at the outer edge of the depression. The interior hole was also circular but six feet wide. This interior shaft was considerably deeper. Given its location, its circular nature and the depth, it seems to have been a well sunk to obtain water although this is not mentioned in the documents and no other information supporting this interpretation can be offered.

Another possible well is located between the northern end of Traverse IV and the rear of Traverse I. This is an irregular rectangular depression in a low point. It does not appear to serve any useful purpose at this location and, in fact, would serve to interrupt the traffic flow around the base of Traverse I.

It is possible this depression does represent a well from the original period of construction. If so, it was not utilized after the battery became much longer and Traverse IV was erected. It may have been filled in and the irregular trace represents settling since it was filled. If it is a well, then it probably relates to the first period of construction when Gun Position 2 was possibly the main part of the fort.

Possible Rifle Pits at the north end of the fort are a very complex series of low ridges with depressions between them. These are located about 25 feet from the river bank and seem, upon first inspection, very much like the rifle pits and traverses observeable today at the "Dead Angle" on Kennesaw Mountain north of Atlanta.

It is not likely that these are part of the defensive structures of Battery Wimberly. They are linked to the earthwork by a very low ditch. Inspection of this ditch reveals it is too far from the river bank to be militarily effective. It is also too shallow to provide adequate protection.

A similar ditch can be found to the south of the earthwork where it is cut by the southernmost fort ditch. At the end of the ditch, it runs into the slough parallel to the Causeway. The ditch north of the fort runs north, parallel to the river edge and about 25 feet away. It crosses the road at several places and can be seen at many points along the road to the museum. It is most likely this ditch marks a field border. It is also likely that the ditch predates the earthwork because the fort interrupts the ditch.

The "rifle pits" seem to be associated with borrow pits used to obtain soil for the earthwork. The higher ground may simply be paths used to carry away the soil in wheelbarrows. If they were gun pits, the earth should have been used to create a parapet on the river side or to the north. This was not done.

An alternative hypothesis is that these ditches are the result of skidding pine logs out when the area was logged several years ago. This does not seem likely either. For one thing, there are sizeable pine stumps in each ditch. These would have been avoided in skidding out the logs. The stumps also argue that the ditches are fairly old. At the north end of each depression there is a pine stump at least one foot in diameter and these appear to mark an old field border and dating after the Civil War when the deep borrow pits and irregular ground of the depressions would not have been suitable for farming without considerable earthmoving.

Immediately to the east of this area is an extensive borrow location where soil was obtained, probably for Traverse VI. If this interpretation is correct, the parapet and traverse work at the northern end of the fort may have terminated because of the lack of readily available soil for construction and the rapidity with which Sherman's troops invested Savannah and the evacuation of the city to save the field army.

INTERPRETATIONS

One series of questions about the fortification relates to the time it took to erect the earthwork. It is difficult to provide exact figures unless the number of men involved is known. Precise formulae can be derived which shed light on the effort but these are generally meaningless in terms of accurate data.

Nevertheless, Mahan provides explicit details about men and time which should be included:

> The time required to throw up a work will depend on the nature of the soil and the expertness of the laborers. From troops unaccustomed to the use of ditching tools, six cubic yards may be considered a far day's work in ordinary soils, when the earth is not thrown higher than six feet; but when a relay is placed on an offset in the ditch, from four to five cubic yards may be taken as the result of a day's work for each man. Expert workmen will throw up from eight to ten cubic yards at task-work" (Mahan 1968:51-52).

Some of the Battery Wimberly configurations are very perplexing. In particular, the type of armament, the deep depressions behind the parapet in certain locations and the lack of a magazine caused considerable concern about what the fort looked like when it was occupied.

One gun position seems to have been built for siege and garrison or field artillery. Along the east side of the fortification adjacent to Traverse V are several locations where a field piece might be mounted to fire over Traverse V. These locations and Gun Emplacement 3 are marked by fairly low parapet walls and generally high, in relationship to the original ground surface, floors.

Since the main means of defending this part of the Savannah approaches was a siege train based on Isle of Hope, these gun posts may have been designed for the siege train. Basically, the siege tried to minimize the shortage of weaponry and manpower by moving the men and guns to threatened points as needed, rather than maintaining armed garrisons at all fortifications. Such an approach represents economy of force but the response time needed to move men and guns to crisis points may not have been rapid enough to effectively oppose Union naval vessels.

It was once thought that the depressions might be connected to the lack of magazines on the site. In this scenario, the defense of the fort was dependent on the Isle of Hope siege train which owuld move artillery to threatened areas. These siege and garrison pieces would be supplied from limber chests which could be protected from direct fire by the deeper depressions behind the parapet adjacent to the higher gun floors.

Unfortunately for this interpretation, only one depression has a ramp leading down for the limbers and the depressions were not always associated with flat areas suitable for gun platforms. Without a ramp to drive the limber in and out of the depressions, they would have not been serviceable for this purpose.

It may be that the depressions represent late modifications to the fort. In this interpretation, the depressions were excavated

during the fall of 1864 as Sherman and the Union Navy tightened their grasp on Savannah. If this is the case, then these deeper depressions may represent unfinished gun positions which were intended to mount permanent cannon on fixed carriages while the earth was utilized to create higher, thicker parapets and traverses. This scenario has some explanatory usefulness but the depressions are deeper than necessary, especially given the known height of the carriages and gun tubes in the Savannah defenses.

At Fort McAllister and Fort Jackson, the pintle mounted gun carriages result in the bottom of the gun tube being about five feet from the floor of the gun emplacement. This would allow the tube to exceed the top of the parapet with from six to twelve inches clearance. Known permanent carriages suggest that the seven feet difference between gun pit floor and top of parapet would be excessive for a carriage and tube which would rise only about five feet unless the platform were above the existing earth floor.

It is possible to suggest a sequence of construction for the earthen mounds but this is highly speculative given the lack of documentary sources and without any excavation. Nevertheless, creating a constructional sequence is a useful exercise because it helps order how the fort was built and offers clues as to why certain mounds are located where they are.

Gun Position 2 may have been the original part of the fort and, if so, then the irregular depression behind it may have been the fort well. After Skidaway Island was abandoned, some efforts were made to fortify the approaches to Savannah and this may have been when Traverses I and II were built to create the battery.

Later, as the extent of Union naval activity became clear, Gun Position 1 was probably constructed to cover Jones Narrows and Skidaway Narrows. It could have also provided fire along the Moon (Back) River. The deep depression behind the parapet between Traverse I and Gun Position 1 was probably not created until later.

Traverse III was built in conjunction with the extension of the parapet along the river front. When this occurred is a matter of conjecture. The parapet and a smaller traverse were probably built as part of the original construction. Later, most probably in the fall of 1864, the parapet and traverse were enlarged. This alteration was probably accomplished using earth removed from behind the parapet to create the depression existing today. Given the amount of soil removed, at least some of this borrow material was probably also used to construct Traverse VI.

Traverses IV and VI seem to be late additions to the site. They are, however, complete which suggests they were built early enough to be part of the planned structure. It is likely they were built in the early fall of 1864 when Sherman's approaching armies made it necessary to increase Savannah's fortifications. It would

not have been necessary to have these mounds unless there was the dual threat of land operations as well as a naval bombardment.

Traverse V does not seem to be complete. It does not have the height of the other traverses and is sloping off to the east. There is also a low area immediately north of Traverse IV. It is thought that this area shows that construction stages of a traverse. The low area was being filled since there is a defacto ramp providing access from the original ground surface which parallels Traverse VI and V on the east. This flat area is of uniform width and has several ramps running from it into the deep borrow pits north and east of Traverse VI.

If this was the last traverse under construction, the Confederates were building it in layers, about four feet thick which were then probably tamped down for stability. More earth was then added to the flat area in a series of steps until final elevations were attained. They were probably bringing the earth in onto the mound from the gateway and dumping it at the north edge of the extant lower part and then trundling their wheelbarrows through the dumped fill back along the eastern walkway area. This scenario would account for the low area at its junction with Traverse IV and would also account for the roadway leading to the lowest point of the traverse but not to one of the "gate areas" such as found between Traverses V and VI or between the southern parapet and Traverse IV.

The area behind the parapet to the north of Traverse III was probably altered later in the fall of 1864. There is a flat area just to the north of the traverse suitable for a siege and garrison field gun or a more permanent carriage. Immediately to the north of the gun position is a depression which was probably at least nine feet below the finished parapet. This may have been intended as a bombproof or magazine but the work does not appear to have been completed. The parapet covering this position was finished but without any firing position except for the souther end where an artillery platform could have been located.

RECOMMENDATIONS & CONCLUSIONS

A number of possible uses can be suggested regarding the site. They could be interpeted without alteration as a later period of fortification to offer comparison with the eighteenth century fortified house (Kelso 1979).

It might be possible to open this portion of the site after restoration of the earthworks. This option, while it would certainly capture the interest of Civil War enthusiasts is not recommended, nor is the first option. In both cases, the additional effort and expense required to maintain and protect the earthworks would significantly increase management problems for the site. The

recent construction of Diamond Causeway, the erection of an electrical line and the proposed widening of the causeway all detract from the nineteenth century impression of the fort as well.

It would be wise to secure the earthworks from continued human traffic and relic hunting. This could be done, as the survey crew found, by creating a brush barrier which would be in keeping with what the fort may have had in the past. Even this barrier did not prove very effective as there was a constant, if low level, stream of illegal site visitation during the project. It might be possible to use a chainlink fence to surround the earthworks but this would be expensive and might encourage additional looting of the site.

The possibility of seeding the site with copper, iron, aluminum and lead pellets has been discussed with the site superintendent. Apparently, this has already been done. While this action would prove a nuisance to relic hunters, it would also make any future magnetometer survey difficult, if not impossible.

Clearance of certain parts of the site to facilitate the survey with long range sight lines results in the cutting of a great deal of scrub brush. In most instances, the larger trees were simply pruned and transects halted if pruning did not allow a sight line. This clearance of the earthwork will have several effects. First, it will allow rain to fall directly on the earthworks which could be detrimental. Initially, this was thought to be a problem but two heavy rains did not cause appreciable runoff problems because the mounds simply absorbed and then percolated the water.

Far more damaging was the human traffic associated with the survey. A great deal of ground cover was removed during the transects as the crews slipped and slid on the mounds. This not only removed ground cover but also caused some of the soil to slide downslope.

Removal of some tree cover and pruning of the larger trees will have the effect of increasing light to the ground which should encourage grass. If the site were seeded with a mix of grasses including Argentine Bahia grass, fescue, andopogon and dent, these grasses would provide nutrients as well as protective cover from the rain. A simialar effort has proven successful at Fort McAllister. However, rough grass or turf requires constant management Andopogon 1987:C7-13) and a more appropriate cover such as light forest (Andropogon 1987:D1-4) may be desired. More comprehensive guidelines may be found in the Earthworks Landscape Management Manual prepared for the Mid-Atlantic Regional Office of the National Park Service (Andropogon 1987).

In the long run, the earthworks are in a remarkably good state of preservation. In order to ensure that they remain in agood health, it is recommended that the embankments be stabilized by sodding them after limited clearance of the tree cover. It is almost certain that the original earthworks were sodded with the

grass held in place by pegs. This can be shown by reference to photographs and documents of Fort McAllister and to accounts of other earthworks in the Savannah defenses (Babits et al 1987; Durham 1985).

Stabilization of the river edge by rip rap or some other form of ground protection is also recommended. The interface between river and fort is subjected to increasing erosion due to heavier use of the river by motorized water craft. The constant wind and tidal water action made little impact over the last 125 years but the accelerating damage to the site as a result of boat wakes must be taken into consideration. Such damage is relatively limited at Battery Wimberly for the present, but observation of the Rose Dhu earthworks on Rooster Point, the water face and Water Battery Number 1 along Causton's Bluff, and Fort Screven on Green Island indicate particularly heavy damage.

At Causton's Bluff, the increased river traffic made such an impact that over 15 feet of earthworks were lost to erosion in less than four years. This damage was monitored while the site was undergoing an archaeological survey by crews from Armstrong State College. If the long term impact of river traffic is not considered at Battery Wimberly, significant loss to the integrity of this national register-eligible site can be predicted within the next ten years.

Stabilization of the river's edge should not proceed until the area has been examined by an archaeologist for cultural materials. At several points along the bluff line, there were concentrations of shell and one point exhibited what appeared to be burnt daub. This clay material was heavily utilized by the Indians on the coast for building houses and lining hearths. When burnt, the clay hardens to a brick-like texture which does not disintegrate easily.

GLOSSARY

Abattis "The large limbs of trees are selected for an abattis. The smaller branches are chopped off, and the ends, pointed and interlaced with some care, are presented towards the enemy. The large end of the limb is secured to the ground by a crotchet-picket, and may be partly imbedded to prevent its being readily torn up. ... Abattis are placed in front of the ditch; in this position they must be covered from the enemy's fire by a small glacis. They are sometimes placed in the ditch against the counterscarp. ... This is an excellent obstacle in a wooded country, and admits of a good defence, if a slight parapet is thrown up behind it. (Mahan 1968:67-68).

Banquette "is the small terrace on which the soldier stands to deliver his fire; the top of it is dominated the tread, and the inclined plane by which it is ascended the slope." (Mahan 1968:4).

"The tread of the banquette is placed four feet three inches below the interior crest; this will admit men of the lowest ordinary stature, to fire conveniently over the parapet. Its width is two feet for a defence of one rank; and four feet for two or three ranks;1 because the third rank does not fire, and is therefore placed on the banquette slope, the base of which is tgwice the altitude, to render the ascent convenient. When the treat of the banquette is very high, and particularly in enclosed works, where interior space is wanted, steps may be substituted for a slope; the rise of the step should be nine inches, and its breadth twelve inches. The tread of the banquette should receive a slope of two inches to the rear to drain off the surface water." (Mahan 1968:32)

Barbette "the barbette carriage belongs to that class which has been denominated immovable. That is to say, it is used simply to fire the piece from, and not to transport it except for very short distances.

The barbette carriage ... is used only in a fixed position in garrison, and is a carriage on which a gun is mounted to fire over a parapet instead of through it, as siege or sea-coast guns usually fire. A barbette-gun is any gun mounted on a barbette carriage." (Gibbon 1970:201).

Berm "The berm, is the horizontal space left between the parapet and the ditch, to prevent the earth from yielding." (Mahan 1968:4).

"The berm is a defect in field works, because it yields the enemy a foot-hold to break a moment, before attempting to ascend the exterior slope. It is useful in the construction of the work for the workmen to stand on; and it throws the weight of the parapet, back from the scarp, which might be crushed out by this weight. In firm soils, the berm may be only from eighteen inches to two feet wide; in other cases, as in marshy soils, it may require a width of six feet. In all cases, it should be six feet below the exterior crest; to prevent the enemy, should he form on it, from firing on the troops on the banquette." (Mahan 1968:32-33).

Counterscarp "The slopes of the scarp and counterscarp will depend on the nature of the soil, and the action on it of frost and rain. The scarp is less steep than the counterscarp; because it has to sustain the weight of the parapet. It is usual to give the slope of the scarp, a base equal to two-third of the base of the natural slope of a mound of fresh earth whose altitude is equal to the depth of the ditch; the base of the counterscarp slope is made equal to one half the same base." (Mahan 1968:33-34).

Crest, Interior "The term crest is applied to those points of the profile, where a salient angle is formed; ..." (Mahan 1968:4).

Ditch "A ditch ... subserves the double purpose of increasing the obstacle, which the enemy must surmount, before reaching the assailed, and of furnishing the earth to form the parapet." (Mahan 1968:2).

"The Ditch should be regulated to furnish the earth for the parapet. To determine its dimensions, the following points require attention; its depth should not be less than six feet, and its width less than twelve feet, to present a respectable obstacle to the enemy. It cannot, ... be made deeper than twelve feet; and its greatest width is regulated by the inclination of the superior slope, which, ... should not pass below the crest of the counterscarp." (Mahan 1968:33).

To determine the exact dimensions of the ditch, for a given parapet, requires a mathematical calculation, which will be given in a Note. On the field a result may be obtained, approximating sufficiently near the truth for practice, by assuming the depth of the ditch and dividing the surface of the profile of the parapet by it

to obtain the width. In excavating the ditch it will be found that more earth will be furnished at the salients than is required for the parapet; and that the re-enterings will not always furnish enough. On this account, the width of the ditch should not be uniform, but narrower at the salients than the re-enterings." (Mahan 1968:34).

Fascine is "a bundle of twigs closely bound up. There are two sizes of facines; one size is nine inches in diameter, and about ten feet long; the other, which is generally termed a saucisson, is twelve inches in diameter and twenty feet long; it is chiefly used for the revetments of batteries." (Mahan 1968:56).

Fraise "This obstacle is formed of palisades, placed, in juxtapositon, either horizontally, or slightly inclined. The best position for a fraise is on the berm, or a little below it, so as to be covered by the counterscarp crest. The part of the fraise under the parapet is termed the tail, and is about five feet long. To make a fraise, a horizontal piece of four-inc scantling, termed a cushion is first laid parallel to the berm; each palisade is nailed to this, and a thick riband it nailed on top of the fraise near the end.

The point of the fraise should be at least seven feet above the bottom of the ditch; and should not project beyond the foot of the scarp, so as not to shelter the enemy from logs, stones, &, rolled from the parapet into the ditch." (Mahan 1968:70).

Gabion "is a round basket of a cylindrical form, without a bottom, its height is usually two feet nine inches, and breath two feet" (Mahan 1968:58-59).

"When used for field works, a fascine is first laid slightly imbedded below the tread of the banquette; the gaion, which is placed on end, rests on this, so as to give it the requisite slospe; it is filled with earth, and the parapet is raised behind it, and another fascine is laid on top, and in some cases two." (Mahan 1968:60).

Glacis "is a small mound of earth raised in front of the ditch; it is seldom used in field works, and is therefore not a constituent part of their profile." (Mahan 1968:4).

Magazine "The main objects to be attended to in a powder magazine are, to place it in the position least exposed to the enemy's fire; to make it shot proof; and secure the powder from moisture.

"If there are traverses, such, for example, as are used in defiladement, the magazines may be made in them; or they may be placed at the foot of a barbette; or, in dry soils, be made partly under ground.

The magazine should be at least six feet high, and about the same width within; its length will depend on the quantity of ammunition. It may be constructed of fascines, gabions, or cofferwork, or any means found at hand may be used which will effect the end in view." (Mahan 1968:89).

Parapet "a covering mass, or embankment, ... to shelter the assailed from the enemy's missiles, to enable them to use their weapons with effect, and to present an obstacle to the enemy's progress, ..." (Mahan 1968:2). "The general form of the parapet is the same for all works. Its dimensions will vary with the kind of soil used in its construction; with the time anbd means that can be employed; with the time and means that the enemy can dispose of in the attack, and the degree of resistance that the work should offer.

The command of the interior crest should be regulated so as to intercept the enemy's missiles, and to shelter the assailed. Men of the greatest ordinary stature, in bringing their muskets to an aim, do not fire at a higher level than about five feet; therefore any mass of this height in front of them will just intercept their fire; but this mass would not shelter a man standing behind it; to effect this, ..., the interior crest should be at least six feet six inches above the terre-plein. The command must then be regulated by these two facts, and this principle may be established. The command of a field work over the ground occupied by the enemy must never be less than five feet; nor less than six feet six inches over that occupied by the assailed. ... .

The thickness of the parapet, which is always estimated by the horizontal distance, between the interior and exterior crests, is regulated by the material used for the parapet; the kind of attack; and its probable duration.

Shot will penetrate ordinary earth, when well rammed, the distances laid down in the following table:

Musket ball, ...	1 foot six inches
6 pound shot, ...	3.5 - 4.5 feet
9 " ...	6.5 - 7 "
12 " ...	8.5 to 10 "

18 and 24 " ... 11.5 to 13 "
In order to insure the safety of the troops, these dimensions are augmented one half; so that no shot shall penetrate more than two-thirds the entire thickness." (Mahan 1968:28-30

"... the vegtable mold on the surface should be scraped off, and reserved to form the top of the parapet, which should be made of earth of this kind, to the depth of at least eighteen inches, to prevent injury to the troops ... " (Mahan 1968:51).

Platforms "When a gun is fired often in the same direction, the ground under the wheels is soon worn into a rut; it is to prevent this that platforms of timber are used in such cases." (Mahan 1968:86-87).

Revetment "consists of a facing of stone, wood, sods, or any other material, to sustain an embankment, when it receives a slope steeper than the natural slope.

In field works revetments are used only for the interior slope of the parapet and for the scarp; for the first sods, pisa, fascines, hurdles, gabions and plank are chiefly used and for the last, timber." (Mahan 1968:52).

Sand Bags "are sometimes used for revetments when other materials cannot be procured; though their use, in most cases, is to form a speedy cover for a body of men. They are usually made of coarse canvass; the bag, when empty, is two feet eight inches long, and one foot two inches wide; they are three-fourths filled with earth, and the top is loosely tied. From their perishable nature they are only used for the occasions, as when troops are disembarked on an enemy's coast." (Mahan 1968:60-61).

Scarp; "The opposite of the ditch counterscarp parapet is 1968:4). See counterscarp.

Slope, Superior, "the top of the paraper, denominated the superior slope, is the line along which the assailed fire on the enemy." (Mahan 1968L3).

Slope, Exterior, "is the part of the parapet towards the enemy; it is always made with the same slope, that the earth when first thrown up, natural takes." (Mahan 1968:3).

Slope, Interior, "sometimes denominated the breast height, is the part against which the assailed naturally lean in the act of firing." (Mahan 1968:3).

Traverses are "mounds of earth thrown up in the work to cover an outlet, to screen the troops from a reverse, or an enfilading fire, &; for powder magazines, when they are not made in the traverses. The area occupied by a traverse will depend on the dimensions of the traverse, and cannot be fixed beforehand; that allowed for a magazine for three or four cannon may be estimated at fifteen or twenty square yards." (Mahan 1968:26)

"The traverse is finished on top like the roof of a house, with a slight pitch; its thinkness at top should seldom exceed ten feet, and will be regulated by the means the enemy can bring to the attack; its sides are made with the natural slope of the earth; but, when the height of the traverse is considerable, the base of the side slopes would occupy a large portion of the interior space; to remedy this, in some measure, the portion of the sides which are below the planes of direct defiladement, may be made steeper than the natural slope; the earth being retained by a revetment of sods, &.

"When the salient of the work is arranged for defense, the traverse cannot be extended to the salient angle; it is usual to change its direction within some yards of the salient, and unite it with the face most exposed. Traverses are also used to cover faces exposed to an enfilade fire; for this purpose they are placed perpendicular to the face to be covered. If several are required, they may be placed twenty or thirty yards apart; each traverse should be about twenty-four feet long, and thick enough to be cannon proof. ...

"after the plan of the work has been regulated, the arrangement of the traverses next demand the attention; the only rule that can be laid down is, to place them in the most facorable position to intercept the reverse and enfilading fire of the enemy; and if there should be a choice with respect to several positions, to select the one which will give the lowest traverse." (Mahan 1968:44-45).

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